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ABSTRACT

This paper presents a research review conducted to determine whether there is empirical support for the idea that people can benefit both emotionally and physically from humor. Special attention is given to stress and coping since these concepts have been of particular interest to humor researchers. The document begins with a discussion of the concepts of humor, stress, and coping. It then moves to a presentation of studies concerned with the emotional benefits of humor. This includes studies on general mood disturbance, anxiety, and depression. After briefly discussing how humor helps a person emotionally and the situational influences on the use of humor, the paper addresses the research on the physical benefits of humor. This includes the effects of humor on immune functions, pain, circulation and respiration, and physical illness. This section is followed by a discussion of gender differences and humor. Finally, the paper's last two sections present applications of the research findings and some concluding thoughts. Although the results of the studies were mixed, it is concluded that sufficient evidence exists for the emotional and physical benefits of humor to warrant further research. (NB)

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A CHEERFUL HEART IS GOOD MEDICINE:
THE EMOTIONAL AND PHYSICAL BENEFITS OF HUMOR

A Doctoral Research Paper
Presented to
the Faculty of the Rosemead School of Psychology
Biola University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Psychology

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by
Brian Richard Humphreys
May 1990

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ABSTRACT

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Studies investigating the emotional and physical benefits of humor are reviewed. Special attention is given to stress and coping since these concepts have been of particular interest to humor researchers. The studies reviewed have explored the relationship between humor and the following variables: general mood disturbance, anxiety, depression, immune functions, pain, circulation and respiration, physical illness, and gender. The results have been mixed; however, there is sufficient evidence for the emotional and physical benefits of humor to warrant further research. Recommendations are offered for future studies.

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A Cheerful Heart is Good Medicine:
The Emotional and Physical Benefits of Humor

Introduction

"A cheerful heart is good medicine, but a crushed spirit dries up the bones" (Prov. 17:22, NIV). Having a good sense of humor is one way of promoting a cheerful heart. According to Fry (1983), physicians and other health professionals have appreciated the healthful benefits of humor for centuries. One aspect of good bedside manner is thought to include being jovial, and physicians have known for a long time the positive effects of humorous exchanges with their patients.

Norman Cousins' now famous experience was certainly a major impetus to the current interest in the healthful benefits of humor. In 1964, Cousins (1979) was diagnosed with ankylosing spondylitis, a painful collagen illness in which the connective tissue in the spine disintegrates. He discovered that watching humorous television shows and movies and reading humorous books alleviated his pain and lead to a reduction in his sedimentation rate (an indication that inflammation has decreased). Contrary to doctors' predictions, Cousins gradually recovered from his illness. His story appeared to lend credence to the notion that laughter does promote healing.
In addition to providing possible physical benefits, humor clearly makes life more enjoyable and can be helpful when dealing with

life's adversities. Maslow (1954) identifies a philosophical, unhostile sense of humor as a characteristic of self-actualizing individuals. This type of humor is philosophical in that "it consists in large part in poking fun at human beings in general when they are foolish, or forget their place in the universe, or try to be big when they are actually small" (p. 222). Maslow's self-actualizing individuals have developed a perspective that leads them to laugh at life's absurdities; this perspective undoubtedly helps them to cope with life's adversities.

According to May (1953), humor helps us to maintain a sense of self: "It is the healthy way of feeling a 'distance' between one's self and the problem, a way of standing off and looking at one's problem with perspective" (p. 61). This thought is echoed by Frankl (1978) who utilizes humor in his logotherapy in order to help people experience self-detachment. It is self-detachment that allows people to laugh at themselves. Frankl believes that self-detachment is a natural coping device of the psyche.

In terms of investigations on the benefits of humor, despite proverbial wisdom and Cousins' experience, few researchers have empirically studied the alleged connection between humor and physical health. Instead, they have focused more on how humor may mitigate mood disturbance, particularly mood disturbance that is a result of stressful life events. Most of the published research on the physical and psychological benefits of humor has been done in the last six years. Researchers have begun to take humor seriously and are finally exploring the adage, "laughter is the best medicine."

Purpose

The purpose of this paper is to determine if there is empirical support for the idea that people can benefit both emotionally and physically from humor. The conclusions of this review should be of special interest to health psychologists since they are interested in helping people to cope with stress and physical pain. If the evidence suggests that humor can help people to cope better with stress, mood disturbance, and pain, then those in the helping professions should begin to assist people in cultivating a sense of humor. The evidence already suggests that we have an innate potential for acquiring a sense of humor (Fry, 1983); therefore, humor may be a coping mechanism that virtually anyone can use when dealing with life's adversities. Another positive aspect of using humor as a coping mechanism is that it often brings pleasure to other people. In summary, it is important to know if there is empirical support for the emotional and physical benefits of humor since it is a phenomenon that is readily available and greatly enjoyed.

The paper begins with a discussion of the concepts of humor, stress, and coping. It then moves to a presentation of studies concerned with the emotional benefits of humor. This includes studies on general mood disturbance, anxiety, and depression. (This paper does not address the relationship of humor and anger, which is a major topic in itself.) After briefly discussing how humor helps a person emotionally and the situational influences on the use of humor, the paper addresses the research on the physical benefits of

humor. This includes the effects of humor on immune functions, pain, circulation and respiration, and physical illness. This section is followed by a discussion of gender differences and humor. Finally, the paper's last two sections present applications of the research findings and some concluding thoughts.

One brief statistical note: It was decided that a study's results would be interpreted as being significant only if probability was less than or equal to the traditionally accepted .05 level. This standard was chosen in order to provide a uniform criterion of evaluation since the studies presented in this paper sometimes used different cutoff points. The effect of this decision was that some studies' results that were declared significant by their authors are reported in this paper as not being significant.

Concept of Humor

What becomes quickly evident when beginning a study of humor is that it is a difficult concept to define: "The definitions offered are almost as many as the theories themselves, and still we are unsure of the complete dimensions of the concept" (Keith-Spiegel, 1972, p. 14). Humor is somewhat paradoxical in that probably everyone would claim to know what it is, yet those who study humor cannot reach a consensus on a precise definition of it. Chapman and Foot (1976) point out the problem of deciding whether humor is a stimulus, response, or disposition; not surprisingly, it can be all three.

Not only are there numerous definitions of humor, but there are also numerous theories of humor. Lefcourt and Martin (1986)

have organized these theories into three categories: arousal, incongruity, and superiority theories. Arousal theories maintain that humor relieves accumulated tension or energy. Freud's theory of humor can be put into this category. Freud believed that humor can be a release for aggressive or sexual impulses, mental energy, or energy related to painful emotions. Other arousal theorists point to a positive correlation between physiological arousal and the experience of humor. Reversal theory, a type of arousal theory, asserts that humor entails an increase in arousal and a reversal from a more serious mental state to a more playful mental state. Laughter increases arousal which in turn increases the person's ability to focus more on his or her current activity.

Incongruity theories are concerned with the cognitive aspects of humor. "According to this approach, the essence of humor resides in the bringing together of two normally disparate ideas, concepts, or situations in a surprising or unexpected manner" (Lefcourt & Martin, 1986, p. 9). The result is a change in cognitive processing of information; the change is experienced as pleasurable.

Superiority theories, the third category, are traced back to Plato and Aristotle. Humor is a response to feeling superior to those one has belittled or to the naive person one used to be. Lefcourt and Martin (1986) believe that the superiority theories are best applied to aggressive or sardonic humor.

Researchers of humor have displayed an interest in the development of humor. McGhee (1983) provides an informative discussion of the general issues of humor development. He notes

that a child's capacity to comprehend and appreciate different types of humor is dependent on the child's level of cognitive development. Children prefer newly mastered, more cognitively advanced forms of humor to previously mastered, less demanding forms of humor. Also, humor is believed to be intrinsically reinforcing (cf. arousal theories of humor)--a characteristic that presumably would not differ among people of similar levels of intelligence. Differences in extrinsic reinforcement and modeling probably account for the reason some people display more humor than others. McGhee points out that there is much evidence that professional humorists usually had humorous models when they were children.

In summary, different definitions and theories have been offered for the concept of humor. The development of a sense of humor is dependent upon cognitive development, intrinsic and extrinsic reinforcement, and modeling.

Concepts of Stress and Coping

Similar to humor, there is not a precise definition of stress. Stress may be conceived of as a stimulus, as a response, or as the interaction between a stimulus and a response (Feist & Brannon, 1988). Researchers in the area of stress often make reference to the influential work of Hans Selye (1976) and his definition of stress as "the nonspecific response of the body to any demand" (p. 1). Kobasa (1985) points out that in many studies "a life event is defined as stressful if it causes changes in, and demands readjustment of, an average person's normal routine" (p. 174). As with humor, the lack

of a precise definition of stress by researchers probably does not prevent people in general from believing that they know what stress is. After all, stress seems to be a widely acknowledged by-product of current American culture. In a more recent work, Selye (1982) states that "nowadays, everyone seems to be talking about stress" (p. 7).

Appley and Trumbull (1986) provide a good overview of the evolution of the concept of stress. What is clear from their discussion is that researchers' conceptualizations of stress have become increasingly complex over the years. In order to understand stress in all its complexity, one must consider physiological, psychological, and sociological factors--hence the need for a multidisciplinary approach.

Researchers have shown much interest over the years in stressful life events. Rabkin and Struening (1976) report that the study of the effects of stressful life events on the etiology of disease was first formally acknowledged at a conference in 1949. Life events research investigates whether there is a temporal relationship between the occurrence of illness and recent increases in stressful events. Stressful life events are believed to have an additive effect: the greater the number of stressful life events, the greater the negative effect on the individual. In addition, "the underlying assumption is that such events serve as precipitating factors, influencing the timing but not the type of illness episodes" (p. 1014).

Researchers have endeavored to determine the statistical correlation between stressful life events and illness (both physical

and mental). Holmes and Rahe (1967) developed the Social Readjustment Rating Scale, which was a landmark development in stressful life events assessment. Their empirically derived scale rank orders forty-three life events according to the amount of readjustment they require of an individual. For example, death of a spouse receives the maximum value of 100.

Even though researchers have consistently found a relationship between stressful life events and illness, people can respond quite differently to the same stressful life event. Research commonly reveals a correlation of .30 between stressful life events and illness; therefore, the stressful life events account for only 9% of the variance in illness. Because of this investigators have tried to determine what variables moderate the relationship between stressful life events and physical or mental illness (Christensen, 1981).

Life is obviously full of stressful events. How a stressful life event affects an individual depends partly on the way he or she copes. According to White (1985), "coping refers to adaptation under relatively difficult conditions" (p. 123). The process of coping has received attention since the early days of psychoanalysis. Psychoanalytic thinking tended to focus more on intrapsychic conflicts than on coping with external stressors. Researchers in the 1960s displayed a great interest in the deleterious effects of stress on people. They were not as interested during that period in the ways people coped with stress. This changed over time as researchers became increasingly more interested in the process of

coping with the deleterious effects of stress. Current research on coping is more interested in conscious responses to external stressors than in unconscious responses to intrapsychic conflicts. This interest has lead to a more objective research methodology: Researchers can identify external stressors and subjects can identify ways in which they cope (McCrae, 1984).

In summary, stress is a complex phenomenon. Researchers have been especially interested in the negative effects of stressful life events on people's health. Studies tend to show that stressful life events account for only 9% of the variance. Finally, modern day researchers are more concerned with the way people consciously cope with external stressors than with unconscious, intrapsychic conflicts.

Emotional Benefits of Humor

As previously noted, most of the research on the benefits of humor has explored the positive effects of humor on subjects' mood. Researchers have been interested in whether humor moderates the effects of stressful life events (an indirect effect) and in whether humor can enhance mood (a direct effect).

The studies in this section are arranged according to their measure of mood. The three categories of mood presented are general mood disturbance, anxiety, and depression. Further, within each category, the studies are arranged according to design (correlational or experimental). The studies are arranged in this

manner so that the focus is on mood disturbance rather than research design.

General Mood Disturbance

Correlational studies. Martin and Lefcourt's (1983) article is the seminal work in the area of sense of humor, stress, and mood disturbance. The results of the three studies presented in their article have encouraged others to investigate empirically the psychological benefits of humor.

In the first study, undergraduate students filled out five measures that were subsequently subjected to hierarchical multiple regression analysis. One measure was the Life Events of College Students, a checklist that assesses stressful life events common to college students. Sense of humor was assessed by four different measures, the first two having been developed by the authors of the study. First, the Situational Humor Response Questionnaire measures how often subjects exhibit mirth in many different situations. Second, the Coping Humor Scale assesses the extent to which subjects report using humor to cope with stressful experiences. The third and fourth measures were two of the subscales of the Sense of Humor Questionnaire: the Personal Liking of Humor subscale, which measures the extent to which subjects report valuing humor in their lives; and the Meta-Message Sensitivity subscale, which measures the extent to which subjects report being capable of perceiving humorous stimuli in their environment. These four humor measures are moderately intercorrelated, so they presumably measure different elements of the phenomenon labeled sense of humor.

The authors assessed subjects' mood disturbance with the Profile of Mood States scale. They derived a Total Mood Disturbance score by subtracting the Vigor scale score from the sum of the scores on the five negative moods (Tension, Depression, Anger, Fatigue, and Confusion). In order to control for transitory moods, the authors asked the subjects to fill out the scale according to the way they had felt in general during the previous month.

Four hierarchical multiple regression analyses were conducted between negative life events, humor measures, and mood disturbance. (The authors chose to use multiple regression analysis because of its effectiveness with continuous data.) The goal was to determine if the magnitude of the correlation between negative life events and mood disturbance varies significantly as scores on the humor measure increase.

The results indicated that for three of the four measures of humor, there was a significant interaction between the humor measure and negative life events. High-humor subjects displayed a weaker relationship between negative life events and mood disturbance when compared to low-humor subjects. Further analyses showed that as negative life events increased, low-humor subjects indicated greater mood disturbance when compared to high-humor subjects. Additional analyses indicated that high-humor subjects did not experience less disturbed moods because they had experienced less negative life experiences. Also, high-humor subjects' smaller correlations were not a result of reduced variability in the measures of negative life events and mood disturbance.

The one measure of humor that did not interact significantly with negative life events in order to reduce mood disturbance was the Meta-Message Sensitivity subscale. It appears that merely being able to discern humorous stimuli in the environment does not mitigate the negative effects of stressful life events on a person's mood.

Martin and Lefcourt's (1983) second study included a behavioral measure of humor. Undergraduate students filled out the Life Experiences Survey, the Situational Humor Response Questionnaire, and the Profile of Mood States scale. They were then asked individually to create an impromptu three-minute comedy routine using objects supplied to them. Their routines were scored for the number of witty remarks they contained and for overall wittiness.

The results were almost identical to the results from the first study. High-humor subjects displayed a weaker, nonsignificant relationship between negative life events and mood disturbance when compared to low-humor subjects. Also, as negative life events increased, low-humor subjects indicated greater mood disturbance when compared to high-humor subjects. Finally, there was a significant positive correlation between humor production scores and Situational Humor Response Questionnaire scores.

The authors discovered when they correlated humor production and negative life events that subjects who indicated that they had experienced high levels of stress during the previous year were more capable of producing humor. Although the implications of

this interesting finding are unclear, it does show that high-humor subjects were not less affected by stress because they had experienced fewer negative life events. The authors conjecture that subjects who experienced many negative life events actively cultivated a sense of humor in order to cope with their stress.

For their third study, Martin and Lefcourt (1983) used a subsample of the subjects from their first study. The subjects, who had already completed the various measures, were shown a mildly stressful silent film about male initiation rites in an Australian aborigine tribe. They were asked to create a humorous narrative for the film; their narratives were scored for overall humorousness. After watching the film, the subjects indicated how likely they would be to use humor in a similar situation in everyday life.

The authors assumed that those subjects who were most adept at creating witty narratives would also tend to use humor when confronted with stressful events in everyday life. Their assumption was substantiated by correlational data involving subjects' humor production scores and their reported use of humor. The results of the hierarchical multiple regression analyses paralled the results of the previous two studies. Humor actually showed a greater moderating effect on this measure than on the other measures of humor in the previous two studies. The authors posit that the greater effect resulted from using a more accurate measure of the way the subjects tend to use humor in everyday life.

Martin and Lefcourt (1983) conclude that the results of their three studies strongly support the idea that humor diminishes the

negative effects of stress. The only case in which the data did not support this idea was when the ability to perceive humor was the measure used. The authors thus conclude that "for humor to moderate the effects of stress, the individual must also place a high value on humor and, more importantly, produce humor, particularly in the stressful situations that he or she encounters in daily life" (p. 1322).

Finally, only the Personal Liking of Humor subscale demonstrated a significant main effect on the Total Mood Disturbance score. The results thus suggest that sense of humor affects mood indirectly by moderating the effects of stressful life events.

Labott and Martin (1987) carried out a study similar to Martin and Lefcourt's (1983) first study. They had subjects complete the Coping Humor Scale, the College Student Life Events Schedule, the Weeping Frequency Scale, and the Profile of Mood States. A hierarchical multiple regression was conducted in which mood disturbance served as the dependent variable.

The results showed that humor alone accounted for a significant amount of the variance in mood disturbance. In contrast, the interaction of negative life events and humor did not account for a significant amount of the variance in mood disturbance. These two findings are the reverse of what Martin and Lefcourt (1983) found in their first study. In addition, the interaction of the variables negative life events, humor, and weeping accounted for a significant amount of the variance in mood disturbance; however, the authors did not clarify the nature of this significant interaction.

The study's main contribution suggests that humor, when deliberately used as a means of coping with stressful life events, may exert a direct influence on disturbed mood--as opposed to influencing mood only indirectly by moderating the effects of stressful life events. There is no obvious explanation for the conflicting findings between this study and Martin and Lefcourt's (1983) study. A possible explanation is that Labott and Martin (1987) used American subjects and Martin and Lefcourt used Canadian subjects. Also, Labott and Martin had a much larger sample (315 versus 56).

A common source of stress for women is their menstrual cycle. Meadowcroft and Zillmann (1987) point out that many women experience dysphoria during the premenstrual and menstrual phases of their menstrual cycle. They conducted a study to investigate whether women's comedy preferences differed depending on their phase in the menstrual cycle. They assigned subjects to one of seven groups depending on which four-day segment of the menstrual cycle they were in. One of their tasks was to select television shows that they would like to watch that evening.

Variation in comedy preference according to the segment of the menstrual cycle approached significance ($p = .055$). Means were combined in order to compare the premenstrual-menstrual phases (days 25-4 of the cycle) and the remaining days (5-24); the two resulting means differed significantly. Women who were in the premenstrual-menstrual phases preferred significantly more comedy than women who were in the remaining days of the menstrual cycle.

A tenable interpretation of these findings is that women in the premenstrual-mentrual phases sought exposure to comedy in order to alleviate their dysphoria. This interpretation would be strengthened if the study had included a measure showing that the dysphoria of premenstrual-menstrual women was significantly greater than the dysphoria of the other women.

A final study assessed the stress experienced by dental patients (Trice, 1986). Patients who had been observed joking and/or laughing before their surgery reported (on a 10-point scale) experiencing less stress during the dental work than did patients who were not observed laughing; however, the difference between groups was not significant. Trice acknowledges that the study did not control all potentially significant variables.

Experimental studies. Lefcourt and Martin (1986) sought to expand upon Martin and Lefcourt's (1983) three correlational studies by conducting two experimental studies. In their first study, subjects were assigned to one of three groups. Each group viewed the mildly stressful silent film shown in study three in Martin and Lefcourt (1983). Depending on their assigned group, subjects were told to create either a humorous narrative or an intellectual narrative, or to watch the film silently. The narratives were spoken into a tape recorder and humorous narratives were rated for humorousness. The subjects were videotaped so that they could be scored on nine behavioral manifestations of mood (e.g., facial grimaces). After the film, subjects reported how they felt at that moment by completing six subscales--five from the Mood Adjective

Checklist and one from the Profile of Mood States. Moods assessed were aggression, pleasantness, social affection, depression, anxiety, and tension. The authors used factor analysis to formulate three dependent variables: negative affect, positive affect, and laughter.

The results for the dependent variable of laughter showed that subjects in the humorous group laughed more often and longer than subjects in the other two groups. The data also indicated that female subjects were significantly more troubled by the film than were male subjects; therefore, a 3 (treatment group) x 2 (sex) analysis of variance was performed on the dependent variables of negative affect and positive affect.

In terms of negative affect scores, the experimental hypothesis was supported with female subjects: Creating a humorous narrative significantly reduced female subjects' distress. This contrasts with male subjects whose scores did not differ across treatment groups. The authors surmise that there may have been a floor effect for male subjects since their negative affect scores were lower than female subjects' scores for all three groups. If male subjects did not find the film to be particularly stressful, then their negative affect scores would not be expected to be lowered by a humorous narrative. The authors also suggest that being asked to create a humorous narrative may have been a stressful request for male subjects. Finally, consistent with the authors' predictions, the data from the Coping Humor Scale revealed that high-humor subjects had significantly lower negative affect scores.

As for positive affect, subjects in both the humorous-narrative group and the no-narrative group had significantly higher positive affect scores than subjects in the intellectual-narrative; however, the humorous-narrative and no-narrative groups did not differ significantly. In addition, subjects who received high ratings for their humorous narratives had higher positive affect scores.

Lefcourt and Martin's (1986) second study was similar to the first study. It was a 2 x 2 x 2 factorial design in which the first factor was type of narrative (humorous or intellectual), the second factor was the source of the narrative (supplied by experimenter or created by subject), and the third factor was subjects' use of humor in coping (high-humor versus low-humor scores on the Coping Humor Scale). The no-narrative group was dropped and only male subjects were used. The study's design controlled for stress that resulted from being asked to create a humorous narrative. This control addressed one of the authors' hypotheses as to why (in the first study) male subjects in the humorous-narrative group did not report less negative affect than male subjects in the other two groups.

The subjects completed the Profile of Mood States and the three humor scales referred to in the first study of Martin and Lefcourt (1983). The subjects were also scored on behavioral manifestations of mood, and their created humorous narratives were rated for humorousness. As in the first study, a factor analysis yielded three factors: total mood disturbance, mirth, and avoidance behavior. These three factors served as the dependent variables.

The analysis of variance for the avoidance behavior variable yielded no significant results. Analysis of the mirth variable revealed that subjects in the humorous-narrative conditions displayed significantly more mirth than subjects in the intellectual-narrative conditions. This was true regardless of who supplied the narrative or how much the subjects reported using humor to cope.

The analysis of variance for the total mood disturbance variable yielded an interesting finding for subjects who report frequently using humor to cope with stress. Contrary to the authors' predictions, high coping-humor subjects in the humorous-narrative conditions experienced a stronger gain in mood disturbance than high coping-humor subjects in the intellectual-narrative conditions. Another finding for the total mood disturbance variable was that there was not a significant negative correlation between rated humorousness of humorous narratives and total mood disturbance.

Finally, the second study did not confirm the authors' hypothesis that male subjects in the first study may have found being asked to create a humorous narrative to be a stressful request. Lefcourt and Martin (1986) conclude that their second study does not lend credence to the idea that humor moderates the effects of stress on mood. They surmise that the male subjects did not experience much stress while watching the film. They attribute the different results for male and female subjects to greater male interest--and hence desensitization--in horror films; therefore, they recommend that more potent stressors be used when doing research

with male subjects. In conclusion, the authors believe that, overall, their five studies (see Martin and Lefcourt, 1983) support the belief that humor moderates the effects of stress on mood.

Adams and McGuire (1986) investigated the effects of humor on overall affect in the elderly. Subjects were residents of a long-term care facility. Over a six-week period, one group of subjects viewed humorous movies while the other group viewed nonhumorous movies. (It is assumed that subjects were randomly assigned even though that is not stated.) Subjects completed the Affect Balance Scale before the program of movies began and after the program was completed.

The results of the study indicated that both groups of subjects experienced significant enhancement of affect over the course of the experiment. A between-group comparison of post-test scores revealed that the humorous group had more enhanced affect, but the difference between groups fell short of being statistically significant. The validity of the study's results is somewhat questionable given that it used a small sample (13) and that it did not have a control group.

If in fact humor does moderate the effects of stress, mental health professionals need to devise ways to assist people in using humor to cope with stress. This could be done on an individual basis or in a group setting. White and Camarena (1989) studied the stress-moderating effects of humor in a small group setting. They randomly assigned college students to a relaxation group, a laughter group, or a health education (control) group. Groups met weekly for

one and a half hours for six successive weeks. The laughter group made use of various humorous exercises and humorous media. A mood-adjective checklist was one of two measures used to assess mood disturbance. Between-groups comparisons revealed that at the end of the study the relaxation group had significantly lower mood disturbance scores than the other two groups. The laughter group did not experience a significant reduction in mood disturbance. The authors state that the data suggest that the laughter group experienced a decrease in mood disturbance relative to the control group, but they provide no data indicating that this between-group difference was significant.

White and Camarena (1989) offer some suggestions as to how future studies could improve upon their experiment. One of their suggestions is that future studies need to assess the long-term effects of laughter interventions. This is an insightful recommendation since an active sense of humor (as opposed to just laughing at humorous stimuli) appears to be necessary if one is going to use humor as an effective means of coping with stress. It may have been that the subjects in the laughter group had not yet appropriated--and thus applied--a humorous outlook. In other words, these subjects may have experienced only transitory psychological relief as a result of participating in humorous activities. It simply may take more than six weeks for people to learn how to approach life with a healthy sense of humor.

Nonstatistical analysis. Some interesting information on the role of humor in coping with the stress of being a prisoner of war has

been uncovered. Ford and Spaulding (1973) were members of a team that performed psychiatric evaluations on the 82 surviving crew members of the USS Pueblo who had been imprisoned for 11 months by the North Koreans. The psychiatric evaluations consisted of a private interview, a Sentence Completion Test, and the MMPI. Psychiatrists assessed through interviews how well the men had coped and what ego defenses they had used in their efforts to cope. Each subject was given a coping score that included his crewmates' views on how well he had coped. The authors then compared the approximate upper third (good coping) of subjects with the approximate lower third (poor coping) of subjects. The T scores from the MMPI were averaged for the subjects in each of the two groups so that comparisons could be made. This global assessment of coping can be construed as a way of assessing mood.

The data were not analyzed statistically; nevertheless, the information deserves attention given the obvious stress the crew members experienced. In terms of humor, the men who coped well were much more likely to use humor than were the men who coped poorly. Ford and Spaulding (1973) specify that "humor was an ability to joke about the characteristics of their captors and to give the guards (and each other) nicknames. There were also efforts at joke telling" (p. 341). They believe that humor was a mature way for crew members to cope with captivity.

In summary, studies investigating the moderating effects of humor on stress as measured by general mood disturbance have yielded mixed results. There is some evidence that humor helps to

alleviate general mood disturbance; however, it is unclear whether humor helps directly or indirectly.

Anxiety

Correlational studies. The previous section discussed the research on the effects of humor on general mood disturbance. Research has also been conducted on the effects of humor on the specific mood of anxiety. Safranek and Schill (1982) performed a study similar to Martin and Lefcourt's (1983) first study. They explored whether the use and/or appreciation of humor helps people to cope with stress. They had undergraduate students complete the Life Experiences Survey, Angell's Humor Use Inventory, and the State-Trait Anxiety Inventory; they also had subjects rate the degree of humorousness of five categories of jokes.

The results showed that stress was significantly correlated with both trait and state anxiety. Separate multiple regression analyses were performed for both of the humor measures. It was found that humor did not diminish the effects of stressful life events (apparently humor did not exert a main effect either).

Safranek and Schill (1982) investigated both trait and state anxiety. Nezu, Nezu, and Blissett (1988) investigated whether humor moderates the effects of stressful life events on just trait anxiety. They had undergraduate students complete the Trait-Scale of the State-Trait Anxiety Inventory, the Life Experiences Survey, the Coping Humor Scale, and the Situational Humor Response Questionnaire. The study employed a prospective design. Subjects completed all the measures in the initial testing and then retook all

but the two humor measures two months later. On the Life Experiences Survey for the second session, subjects reported just the stressful life events that had occurred between the two test sessions. This was done in order to control for prior stressful events. A cross-sectional analysis was done on the data from the first test session while the prospective analysis used data from both test sessions. Both sets of data were subjected to hierarchical multiple regression analyses.

The cross-sectional data on anxiety was analyzed separately for each of the two humor measures. What was discovered was that neither humor nor the interaction between humor and life stress was significantly related to anxiety scores. As for the prospective data, the distress scores from the second test session were the dependent measures. Previous level of distress was controlled by entering the first test session's anxiety scores as a covariate. The results were virtually identical to the results from the cross-sectional analyses. A limitation of the study is that it used only a trait measure of anxiety. Nezu et al. (1988) state that "it might be additionally useful to have included a state anxiety measure as a means of better identifying feelings of anxiety associated with a particular stressful event when compared with only generalized anxiety feelings" (p. 524).

In a creative study of the relationship between mood and incidents of humor and overt laughter, Mannell and McMahon (1982) had undergraduate students keep a diary of humorous events over the course of a typical day. One of the tasks in keeping the diary was to rate the amount of amusement the humorous stimuli produced.

Subjects also filled out the Nowlis Mood Adjective Checklist, which yields seven mood dimensions, including anxiety.

Anxiety was found to have a significant negative correlation with all three measures of humor: number of humorous incidents, number of overt laughs, and average amusement scores. These results indicate that humor may help to decrease an individual's experience of anxiety; however, since this is a correlational study, causality cannot be demonstrated. Also, the study's design may have created a demand characteristic in that it may have "sensitized the subjects to the presence of humor in their daily activity and consequently modified the impact of humor on mood levels differently from normal" (p. 153). Perhaps the subjects could have been asked to record other events in order to disguise the study's intent. Another weakness was that there was not a control group.

Experimental studies. As with the correlational studies, the experimental studies on the effect of humor on anxiety have produced mixed results. In a study that explored the effects of humor on anger, Dworkin and Efran (1967) also found that humor decreased subjects' anxiety. They measured anxiety with the Nowlis-Green Mood Adjective Check List. The experimenters angered subjects (male undergraduate students) and then had them listen to humorous tapes. The humorous tapes significantly decreased subjects' anxiety; the control tapes (documentary readings and music) did not have this effect.

The Dworkin and Efran (1967) study apparently assessed state anxiety since the experimenters manipulated subjects' mood. State

anxiety was shown to be amenable to humor in a well-designed study by Robles, Smith, Carver, and Wellens (1987). They explored the effect of subliminal humorous visual images on state anxiety. They randomly assigned undergraduate students to one of three conditions--positive (humorous) image, negative (threatening) image, or neutral (control) image. They assessed anxiety with the anxiety portion of the Multiple Affect Adjective Checklist and the State-Trait Anxiety Inventory.

The data revealed that subjects who were shown humorous subliminal visual images had significantly lower anxiety scores on the Multiple Affect Adjective Checklist and on the State scale of the State-Trait Anxiety Inventory when compared to subjects who were shown neutral or negative subliminal visual images. This significant difference was not found for trait anxiety. The results of this study and Dworkin and Efran's (1967) study point to the significance of the aforementioned weakness of Nezu et al. (1988), who did not assess state anxiety and thus perhaps missed some important data.

In addition to measuring general mood disturbance, White and Camarena (1989) assessed state anxiety in subjects with the State-Trait Anxiety Inventory. As with general mood disturbance, the laughter group did not experience a significant reduction in anxiety. The relaxation group approached ($p = .055$) a significantly greater reduction in anxiety than the laughter and control groups. The laughter group had lower anxiety scores than the control group, but the difference was nonsignificant.

White, Winzelberg, and Schultz (1988) assessed the immediate effects of a humor intervention on subjects' state anxiety. Undergraduate students were randomly assigned to one of two laughter groups (which differed in terms of number of subjects), a relaxation group, or a control group. Subjects completed the anxiety measure, were stressed, completed the measure again, received group treatment, and then completed the measure a third and fourth time at five-minute and ten-minute intervals after the group treatment. The results indicated that all the groups significantly lowered subjects' levels of anxiety; no group showed significantly more reduction in state anxiety than the other groups.

White et al. (1988) offer some critical observations of their study. One is that subjects did not laugh much; therefore, the effects of laughter may not truly have been evaluated. Another observation is that despite random assignment, subjects in the laughter groups experienced more stress in response to the stressor.

In summary, as with general mood disturbance, studies investigating the moderating effects of humor on anxiety have yielded mixed results. Humor apparently has a mitigating effect on state anxiety but not on trait anxiety. Also, humor has been shown to affect anxiety directly, but it has yet to be shown clearly that it affects anxiety indirectly.

Depression

All three studies that investigate whether humor moderates the effects of stress as measured by depression are correlational. As with the previously discussed measures of mood, the relationship

between humor and depression is ambiguous. Safranek and Schill (1982) had undergraduate students complete the Life Experiences Survey and Angell's Humor Use Inventory; they also had subjects rate the degree of humorousness of five categories of jokes. They assessed depression with the Beck Depression Inventory. The results for depression were the same as the study's results for anxiety: Multiple regression analyses revealed that humor did not diminish the effects of stressful life events. Again, humor apparently did not exert a main effect on depression. As with anxiety, stress was significantly correlated with depression.

In contrast, Nezu et al. (1988) did find that humor moderates the effects of life stress as measured by depression. They, too, employed the Beck Depression Inventory and the Life Experiences Survey; however, they used different humor measures--the Coping Humor Scale and the Situational Humor Response Questionnaire.

As previously discussed, Nezu et al. (1988) obtained both cross-sectional and prospective data. The multiple regression analyses performed on the cross-sectional data showed that there was a significant interaction between stressful life events and both humor measures. This indicates that humor moderated depression that was related to stress. Another major finding was that humor exerted a significant main effect on depression. In sum, humor significantly affected depression both indirectly and directly.

As for the prospective data, the results were virtually identical to the results of the cross-sectional analyses. In addition, the authors conducted follow-up analyses which revealed that high-humor

subjects experiencing a lot of stress reported lower levels of depression relative to low-humor subjects experiencing a lot of stress.

The results of the final study on humor and depression fall between the first two studies' results. Porterfield (1987) found in his study of undergraduate students that humor, on the one hand, did not moderate the effects of stress on depression. On the other hand, humor did exert a significant main effect on depression.

A viable explanation for the conflicting results is that the three studies used different combinations of the various measures. Porterfield (1987) used the Center for Epidemiological Studies Depression Scale instead of the Beck Depression Inventory. He also used a different measure of stress--the College Students' Life Events Schedule. Like Nezu et al. (1988), Porterfield used the Coping Humor Scale and the Situational Humor Response Questionnaire. Thus the lack of a uniform combination of measures may account for the different results. Also, sample size may be a factor. Porterfield had 220 subjects, Safranek and Schill (1982) 161 subjects, and Nezu et al. 87 subjects. In summary, although there is evidence that humor may directly and/or indirectly moderate depression, the evidence is not conclusive.

In general, the research indicates that humor does have some psychological benefits. Even though the evidence is not consistent, it is probably safe to conclude that humor can moderate the negative effects of stressful life events on a person's mood. There is also some evidence that humor enhances mood directly as well. So far there is

no evidence that humor exerts a significant effect--either directly or indirectly--on trait anxiety.

How Humor Helps

If humor moderates the negative effects of stress and/or helps to alleviate negative affect directly, then the next step is to determine the way in which humor exerts its positive influence. Nezu et al. (1988) suggest that humor affects the way people perceive stressful life events. Humor may lead people to have "positive evaluations concerning self-efficacy and personal control. For example, appraisal of the stressful event may allow it to be perceived more as a 'challenge' than a 'threat'" (pp. 524-525). Dixon (cited in Nezu et al.) states that humor produces a cognitive shift that in turn affects the way the person feels. A cognitive shift can help the person to gain some distance from the stressor and to see the problem from a different angle.

Humor may also be helpful for interpersonal reasons. A person who uses humor to cope with stress may gain the support of others since people enjoy humor. In contrast, someone who deals with stress by expressing negative feelings (e.g., whining) may tend to push people away (Nezu et al., 1988).

A third way that humor may be helpful is that it may reduce a person's concentration. Mannell and McMahon (1982) found a significant negative correlation between concentration and the amount of humorous incidents and overt laughter during the course of a day. Perhaps humor hinders a person from focusing intently on his or her problems.

Situational Influence

Stressful life events may vary a great deal. McCrae (1984) conducted two studies in which he divided stressful life events into three categories--loss, threat, and challenge. He surveyed adults from the entire life span to determine what coping mechanisms tended to be used with each of the three categories of stressful life events. He discovered that humor was used significantly more often to cope with challenge than to cope with either loss or threat. A challenge typically entails encountering a new circumstance that is positive and freely chosen: starting school, getting married, becoming pregnant or having a baby, starting a new career, getting promoted, or being elected to office.

McCrae's (1984) findings reveal what is common, which may not necessarily be what is optimal. Nevertheless, if people report that they tend to find humor to be most helpful for coping with challenge, then perhaps humor is in fact better suited for dealing with challenge than it is for dealing with either threat or loss. The results also suggest that humor may be least suited for dealing with loss.

Physical Benefits of Humor

Many mental health professionals have a great interest in the interaction of the mind and body and how this interaction relates to physical health. McClelland (1989), who has studied the effects of motivation on physical health, believes that the "study of the role of

personality factors in health and disease represents an exciting new field of great complexity, great difficulty, and great promise" (p. 682). One of those personality factors currently being investigated is sense of humor.

The studies in this section that contain statistical analysis are arranged according to their dependent variables. Since there are only a small number of studies, there is no arrangement according to whether the design is experimental or correlational. Finally, this paper does not include those studies that assess the effects of laughter on physiological activity that can occur with either strenuous activity or stress (e.g., changes in heart rate, blood pressure, respiration).

Immune Functions

One area of the mind-body relationship that has been explored is the effect of the mind on the immune functions (e.g., McClelland, 1989). If "laughter is the best medicine," then perhaps it enhances the body's ability to ward off sickness. Dillon, Minchoff, and Baker (1985) conducted an experiment to investigate whether humor enhances immune functions. Undergraduate students were randomly assigned to one of two groups. In one group subjects viewed a humorous videotape and then a didactic (control) videotape; in the other group subjects viewed the videotapes in reverse order. Subjects salivated into a test tube for 5 minutes both before and after viewing each videotape. Subjects rated the humorousness of each videotape and also filled out the Coping Humor Scale.

Subjects were asked for saliva samples so that their concentrations of salivary immunoglobulin A (IgA) could be measured. This measure was used because IgA apparently helps the body ward off viral infections, especially upper respiratory tract infections. The results indicate that subjects' concentration of IgA increased significantly after they viewed the humorous videotape; this was not the case for the didactic videotape.

An interesting finding was that scores on the Coping Humor Scale were positively correlated with IgA concentrations prior to viewing either videotape. There was also a positive correlation between the Coping Humor Scale scores and IgA concentrations averaged over all four conditions. Dillon et al. (1985) state that the "results therefore suggest that salivary IgA concentrations are directly related to subjects' perception of their use of humor as a coping device" (p. 15).

The subjects' significant increases in IgA concentrations that resulted from viewing a humorous videotape declined soon after the viewing. Of particular interest is the significant positive correlation between using humor as a means of coping and IgA concentrations. The overall findings suggest that viewing humorous entertainment may enhance a person's immunity for a brief time, but that developing humor as a coping device may enhance a person's immunity over a long period of time.

The study by Dillon et al. (1985) is encouraging in that it suggests that humor has healthful side effects; however, their study is not without its flaws. First, they used an extremely small sample.

They began with ten subjects but dropped one subject's data because she did not salivate enough. Second, there was not a true control group, i.e., a group that did not view any videotape. A true control group would have assessed whether salivary IgA concentrations naturally fluctuated. Third, subjects were told at the start about the purpose of the study. This may have served as a demand characteristic. Despite these shortcomings, the study appears to have some validity, and thus points to the healthful benefits of humor.

Another way that humor may enhance immune functions is by decreasing blood levels of immune suppressors such as cortisol, epinephrine, and norepinephrine. Lee Berk (personal communication, July 25, 1989), an immunologist at the Loma Linda University School of Medicine, has been investigating some of the neuroendocrine activity that accompanies laughter. Among the hormones that he has been studying are cortisol, epinephrine, and norepinephrine. He has discovered that watching a humorous film leads to a decrease in blood levels of cortisol. Also, simply anticipating watching a humorous film apparently can decrease blood levels of epinephrine and norepinephrine; actually watching the humorous film then maintains the lowered levels. Levi (1965) in contrast to Berk, found that watching a humorous film increased levels of epinephrine and norepinephrine; however, his use of urine samples instead of blood samples may, according to Berk, have contributed to their obtaining different results.

Experience of Pain

Norman Cousins (1979) claims that engaging in strong laughter alleviated his pain to the point that he could sleep painlessly for at least two hours. Cogan, Cogan, Waltz, and McCue (1987) conducted two experiments to explore the alleged pain-reducing effects of laughter. In their first study, randomly assigned undergraduate students either listened to one of three types of tapes (laughter, relaxation, informative narrative) or did not listen to a tape (control). Afterwards, subjects' threshold for pain was measured with a blood pressure cuff. The results showed that subjects in the laughter and relaxation groups had significantly greater discomfort thresholds than subjects in the narrative and control groups.

Cogan et al. (1987) conducted a second study to determine if it is laughter per se or being distracted while focusing on humorous material that leads to an increase in one's discomfort threshold. Undergraduate female students had their discomfort thresholds measured before the treatments were implemented. Subjects were then randomly assigned to one of five groups; however, they were matched for discomfort thresholds. Groups 1 through 3 listened to a humorous recording, an interesting narrative, and an informative narrative, respectively. Group 4 performed a multiplication task and Group 5 was a no-treatment control. After ten minutes, Groups 1 through 4 had their discomfort thresholds measured again; Group 5 had its discomfort threshold immediately measured again. Subjects' pretreatment measures were subtracted from their posttreatment measures, and the differences were subjected to statistical analysis.

The results indicated that the laughter group's difference score was significantly greater (i.e., a greater discomfort threshold) than all the other groups' difference scores, the only exception being the uninteresting narrative group, although that comparison approached significance ($p < .07$). Perhaps the uninteresting narrative group induced a degree of relaxation in subjects. Cogan et al. (1987) conclude that "the data from these studies indicate that laughter increases discomfort thresholds as effectively as relaxation. The data also indicate that the effect is due to the humorous nature of the material, rather than any interest-compelling character of the material alone" (p. 143). They also point out the relative ease of using laughter to decrease pain sensitivity; therefore, they suggest that laughter may be useful in circumstances involving temporary pain induction (e.g., injections) or recovery (e.g., pain from an episiotomy).

Using a poorly designed study, Adams and McGuire (1986) investigated whether humor would help to lower pain in elderly residents in a long-term care facility. Subjects viewed either humorous or nonhumorous movies. (It is assumed that subjects were randomly assigned even though that is not stated.) The study took place over a period of six weeks.

Because of procedural difficulties, Adams and McGuire (1986) relied on subjects' subjective evaluations of their pain. Most of the subjects reported experiencing less pain at the end of the study. The authors believe that the subjects attempted to please the researchers; therefore, the subjects' self-reports of pain may have

been biased. A second measure of pain consisted of visually comparing the amount of PRN medications taken during a baseline period with the amount taken during the six-week study. This nonstatistical assessment revealed that all the subjects in the humor group decreased their PRN medications, while only some of the subjects in the nonhumorous group decreased their PRN medications.

Adams and McGuire's (1986) study has glaring weaknesses: small sample (13), no control group, and no statistical analysis of experience of pain. Nevertheless, their results are encouraging in that they point to a possible means of helping the elderly experience less pain. They also discovered that their subjects preferred visual slapstick humor, a piece of information that could prove useful for those who work with the elderly.

How might humor help to alleviate pain? Smith (1986) presents three possible ways. First, humor, being an intense emotion, may suppress the transmission of painful impulses (the gate control theory). Second, humor may enhance the pain-reducing effect of endorphins, the body's natural pain killer; however, Berk's (personal communication, July 25, 1989) research so far has shown that humor does not increase blood levels of beta endorphins. Third, laughter may help to alleviate pain by decreasing muscular tension and increasing muscular relaxation.

Circulatory and Respiratory Systems

In addition to increasing both pain tolerance and immune functions, "laughter can be said to give the body a miniworkout and

has been compared to stationary jogging" (Fry, 1984, p. 262). It can help the circulatory system to disseminate high-density lipoproteins, a process linked to low rates of heart disease. Laughter also helps to rid the lungs of residual air. Augmented aeration decreases the lungs' susceptibility to microorganism colonization. Finally, laughter can help to expel purulent discharges in the respiratory tract.

Physical Illness and Humor

It has been demonstrated that humor can increase a person's pain threshold and immune functioning. Porterfield (1987) explored whether humor mitigates the negative effects of stress on physical well-being. He did this by having undergraduate students complete the College Students' Life Events Schedule, the Situational Humor Response Questionnaire, the Coping Humor Scale, and a modified version of the Cohen-Hoberman Inventory of Physical Symptoms. He performed two multiple regression analyses--one for each humor measure--to determine the relationship among stress, humor, and physical illness.

The results of the study revealed that humor was not significantly correlated with physical illness. In addition, humor did not interact significantly with stressful life events in predicting illness scores. According to Porterfield (1987), "it is clearly premature, however, to conclude that a hearty sense of humor does not promote physical well-being" (p. 315).

Might there be a relationship at the societal level between humor and the development of psychosomatic disease? Siberman (1987) thinks that there is, but his data analysis is extremely weak.

He attempts to correlate nonstatistically the incidence of psychosomatic disease in the United States with the amount of humor in the media. His hypothesis is interesting, but the lack of statistical analysis results in virtually useless data. Even Silberman states that the data "lends itself to a variety of interpretations, and at this point is certainly not conclusive" (p. 111).

Gender Differences

For the most part, males and females do not differ significantly in terms of their use of humor as a way of coping with stressful life events or their physiological reactions during laughter. Most of the occasional statistically significant differences in certain areas are not practically significant. Some differences, however, are worth presenting, such as the previously discussed findings of Lefcourt and Martin (1986). The following studies also revealed some significant differences.

Schill and O'Laughlin (1984) investigated whether a person's ability to cope well with stress is related to a preference for certain types of humor. Undergraduate students completed the Life Experiences Survey and the Beck Depression Inventory. They also rank ordered their preferences for five categories of humor: sexual, hostile, nonsense, ridicule, and sick. Based on these measures, subjects were assigned to one of four groups: efficient coping (high stress-low depression), inefficient coping (high stress-high depression), unchallenged and adjusted (low stress-low depression), and chronic depressives (low stress-high depression).

The results show that the only significant finding was that for the male subjects, those who coped efficiently and those who were unchallenged and adjusted ranked preference for sexual humor higher than did those who coped inefficiently. The female subjects did not differ according to group. Schill and O'Laughlin (1984) conclude "that preference for sexual humor and coping with stress are related for men but not for women" (p. 310). They mention that this difference may point to a double standard in the way males and females are socialized in the area of sexuality.

In a study already reviewed in this paper, Safranek and Schill (1982) found that for female subjects there was a significant positive correlation between humor appreciation and negative life events, and between humor appreciation and depression scores. These findings suggest that females may tend to see the humor in things as stressful life events and depression increase.

None of the studies reviewed thus far has revealed a significant difference between men and women on humor measures alone. In contrast, Rim (1988), who carried out his study with undergraduate and graduate students in Israel, found that men scored significantly higher than women on four of five humor measures. Perhaps these unique results reflect cultural differences in the socialization of humor. The study also found that for men, two humor measures had a significant negative correlation with age and one had a significant positive correlation; for women, two humor measures had a significant positive correlation with age. (Age range was 22 to 48.)

In conclusion, men and women may differ some in the ways that they use humor to cope with stressful life events. These differences are probably limited to very specific areas, e.g., use of sexual humor (Schill & O'Laughlin, 1984) and use of humor in resolving potential marital conflicts (Lefcourt & Martin, 1986). The evidence suggests that, in general, men and women do not differ significantly in their use of humor to cope with stressful life events.

Application

There is enough anecdotal and empirical evidence on the benefits of humor to justify actively cultivating this naturally occurring coping mechanism in our own lives and in the lives of others. Specifically, there is ample opportunity for mental health workers to introduce humor into the lives of the people with whom they have contact. In fact, this is already going on in some places. The Wellness Community in Santa Monica, California, makes active use of humor in helping its participants cope with cancer. Hospitals are using clowns and humor stations to help raise the spirits of patients (Long, 1987). The Laughter Project at the University of California, Santa Barbara, educates students about the benefits of making humor an active part of one's life (Laughter and Stress, 1984).

Since possessing a good sense of humor is apparently more useful than simply being exposed to humorous stimuli, it is important to know how to cultivate a sense of humor. Joel Goodman (1983), who founded the HUMOR Project in 1977, has come up with a

method for developing one's sense of humor. His method includes such tasks as looking for humorous things in the environment, laughing at oneself, and cultivating certain skills (e.g., exaggeration). Robinson (1977) is particularly interested in promoting the use of humor in the health professions.

An area that has received much attention in the literature is the role of humor in psychotherapy (see Saper, 1987, and Salameh, 1983, for discussions of this topic). Very little of this literature is empirical; most of it is either theoretical or based on the author's experience. Some forms of therapy--such as logotherapy (Frankl, 1978), natural high therapy (O'Connell, 1981), and provocative therapy (Farrelly & Matthews, 1981)--actively use humor. Prerost (1988) has developed a way to use humor in guided imagery to help alleviate stress. Also, perhaps one of the most effective means of promoting the development of a client's sense of humor is for the therapist to model a healthy, active sense of humor.

In summary, humor can be applied effectively in different settings. People can actively cultivate a sense of humor in themselves and in others. Humor may even be a major component of psychotherapy.

Conclusions

Humor is a complex concept that has been studied from many different angles. This paper has focused on just two of those angles: the emotional and physical benefits of humor. The research results have not been unequivocal. On the one hand, it is not clear, for example, if humor affects mood directly or indirectly; perhaps it

affects mood both ways. And not all studies have shown humor to be significantly helpful. On the other hand, it is encouraging that a number of studies have demonstrated the healthful benefits of humor.

Perhaps the most important point to be made is that people need to cultivate actively a sense of humor, as opposed to responding passively to humorous stimuli. This needs to occur if people are to experience more than transitory relief from life's trials. Maslow's (1954) self-actualizing individuals model the necessity of not taking life too seriously.

The empirical investigation of the emotional and physical benefits of humor is still in its infancy. Even though the results thus far have been mixed, they have been encouraging enough to justify doing further empirical research. In an attempt to clarify the relationship between humor and health, future research should go beyond the replication of existing studies. First, since it takes time to develop a sense of humor, researchers need to design and implement longitudinal studies. One possibility would be to study over a period of months people who have participated in educational workshops on humor (e.g., the University of California, Santa Barbara). These workshops could implement Goodman's (1983) ideas.

Second, useful information might be gained through naturalistic observation of pre-existing groups such as The Wellness Community. A strength of this approach is that there is no doubt about the impact of the stressor (in this case cancer), which addresses a problem encountered by Lefcourt and Martin (1986).

Third, most of the studies reviewed in this paper used college students for their subjects. This is extremely common but nonetheless limiting. The obvious remedy is to include a broader age range of subjects in future studies. In addition, future studies should explore the relationship between humor and mental health in subjects from clinical populations. Nezu et al. (1988) specifically recommend that future studies be conducted with severely depressed subjects. Future research with clinical populations should also investigate ways that subjects use humor defensively, e.g., as a means of avoiding something that needs to be addressed or experienced. A related issue also worthy of investigation would be how to help clients employ humor as a healthy defense rather than as an unhealthy defense.

Finally, McCrae (1984) found that people preferred to use humor when coping with challenges as compared to coping with threats or loss. This is an interesting finding in that it may be the first step in determining when humor is most effective in dealing with stressful life events. Studies on the differential effectiveness of humor (challenge vs. threat vs. loss) would certainly be welcome.

Humor has at least one major advantage over most other coping mechanisms: It is fun. Not only can it help a person who is struggling with life's trials, but it can also simultaneously bring happiness to others--perhaps alleviating their suffering, if only for a moment. Laughter may not be the best medicine, but it sure can bring much relief.

REFERENCES

Adams, E. R., & McGuire, F. A. (1986). Is laughter the best medicine? A study of the effects of humor on perceived pain and affect. Activities, Adaptation, & Aging, 8, 157-175.

Appley, M. H., & Trumbull, R. (1986). Development of the stress concept. In M. H. Appley & R. Trumbull (Eds.), Dynamics of stress: Physiological, psychological, and social perspectives (pp. 3-18). New York: Plenum Press.

Chapman, A. J., & Foot, H. C. (1976). Introduction. In A. J. Chapman & H. C. Foot (Eds.), Humour and laughter: Theory, research and applications (pp. 1-7). London: Wiley.

Christensen, J. F. (1981). Assessment of stress: Environmental, intrapersonal, and outcome issues. In P. McReynolds (Ed.), Advances in psychological assessment (Vol. 5, pp. 62-123). San Francisco: Jossey-Bass.

Cogan, R., Cogan, D., Waltz, W., & McCue, M. (1987). Effects of laughter and relaxation on discomfort thresholds. Journal of Behavioral Medicine, 10, 139-144.

Cousins, N. (1979). Anatomy of an illness as perceived by the patient. New York: Norton.

Dillon, K. M., Minchoff, B., & Baker, K. H. (1985). Positive emotional states and enhancement of the immune system. International Journal of Psychiatry in Medicine, 15, 13-18.

Dworkin, E. S., & Efran, J. S. (1967). The angered: Their susceptibility to varieties of humor. Journal of Personality and Social Psychology, 6, 233-236.

Farrelly, F., & Matthews, S. (1981). Provocative therapy. In R. J. Corsini (Ed.), Handbook of innovative psychotherapies (pp. 678-693). New York: Wiley.

Feist, J., & Brannon, L. (1988). Health psychology: An introduction to behavior and health. Belmont, CA: Wadsworth.

Ford, C. V., & Spaulding, R. C. (1973). The Pueblo incident. Archives of General Psychiatry, 29, 340-343.

Frankl, V. E. (1978). The unheard cry for meaning. New York: Simon & Schuster.

Fry, W. F., Jr. (1983). Special report: Laughter and health. In E. Bernstein (Ed.), 1984 medical and health annual (pp. 259-262). Chicago: Encyclopaedia Britannica.

Goodman, J. (1983). How to get more smileage out of your life: Making sense of humor, then serving it. In P. E. McGhee & J. H. Goldstein (Eds.), Handbook of humor research: Vol. 2. Applied Studies (pp. 1-21). New York: Springer.

Holmes, T. H., & Rahe, R. H. (1967). The Social Readjustment Rating Scale. Journal of Psychosomatic Research, 11, 213-217.

Keith-Spiegel, P. (1972). Early conceptions of humor: Varieties and issues. In J. H. Goldstein & P. E. McGhee (Eds.), The psychology of humor (pp. 4-39). New York: Academic Press.

Kobasa, S. C. (1985). Stressful life events, personality, and health: An inquiry into hardiness. In A. Monat & R. S. Lazarus (Eds.), Stress and coping: An anthology (2nd. ed., pp. 174-188). New York: Columbia University Press.

Labott, S. M., & Martin, R. B. (1987). The stress-moderating effects of weeping and humor. Journal of Human Stress, 13, 159-164.

Laughter and stress: An educational programming handbook for the college community. (1984). Santa Barbara: University of California, Santa Barbara.

Lefcourt, H. M., & Martin, R. A. (1986). Humor and life stress: Antidote to adversity. New York: Springer.

Levi, L. (1965). The urinary output of adrenalin and noradrenalin during pleasant and unpleasant emotional states. Psychosomatic Medicine, 27, 80-85.

Long, P. (1987, October). Laugh and be well? Psychology Today, pp. 28-29.

Mannell, R. C., & McMahon, L. (1982). Humor as play: Its relationship to psychological well-being during the course of a day. Leisure Sciences, 5, 143-155.

Martin, R. A., & Lefcourt, H. M. (1983). Sense of humor as a moderator of the relation between stressors and moods. Journal of Personality and Social Psychology, 45, 1313-1324.

Maslow, A. H. (1954). Motivation and personality. New York: Harper & Brothers.

May, R. (1953). Man's search for himself. New York: Norton.

McClelland, D. C. (1989). Motivational factors in health and disease. American Psychologist, 44, 675-683.

McCrae, R. R. (1984). Situational determinants of coping responses: Loss, threat, and challenge. Journal of Personality and Social Psychology, 46, 919-928.

McGhee, P. E. (1983). Humor development: Toward a life span approach. In P. E. McGhee & J. H. Goldstein (Eds.), Handbook of humor research: Vol. 1. Basic issues (pp. 109-134). New York: Springer.

Meadowcroft, J. M., & Zillmann, D. (1987). Women's comedy preferences during the menstrual cycle. Communication Research, 14, 204-218.

Nezu, A. M., Nezu, C. M., & Blissett, S. E. (1988). Sense of humor as a moderator of the relation between stressful events and psychological distress: A prospective analysis. Journal of Personality and Social Psychology, 54, 520-525.

O'Connell, W. E. (1981). Natural high therapy. In R. J. Corsini (Ed.), Handbook of innovative psychotherapies (pp. 554-568). New York: Wiley.

Porterfield, A. L. (1987). Does sense of humor moderate the impact of life stress on psychological and physical well-being? Journal of Research in Personality, 21, 306-317.

Prerost, F. J. (1988). Use of humor and guided imagery in therapy to alleviate stress. Journal of Mental Health Counseling, 10, 16-22.

Rabkin, J. G., & Struening, E. L. (1976, December). Life events, stress, and illness. Science, pp. 1013-1020.

Rim, Y. (1988). Sense of humor and coping styles. Personality and Individual Differences, 9, 559-564.

Robinson, V. M. (1977). Humor and the health professions. Thorofare, NJ: Charles B. Slack.

Robles, R., Smith, R., Carver, C. S., & Wellens, A. R. (1987). Influence of subliminal visual images on the experience of anxiety. Personality and Social Psychology Bulletin, 13, 399-410.

Safranek, R., & Schill, T. (1982). Coping with stress: Does humor help? Psychological Reports, 51, 222.

Salameh, W. A. (1983). Humor in psychotherapy: Past outlooks, present status, and future frontiers. In P. E. McGhee & J. H. Goldstein (Eds.), Handbook of humor research: Vol. 2. Applied studies (pp. 61-88). New York: Springer.

Saper, B. (1987). Humor in psychotherapy: Is it good or bad for the client? Professional Psychology: Research and Practice, 18, 360-367.

Schill, T., & O'Laughlin, S. (1984). Humor preference and coping with stress. Psychological Reports, 55, 309-310.

Selye, H. (1976). The stress of life (rev. ed.). New York: McGraw-Hill.

Selye, H. (1982). History and present status of the stress concept. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects (pp. 7-17). New York: Free Press.

Silberman, I. N. (1987). Humor and health: An epidemiological study. American Behavioral Scientist, 30, 100-112.

Smith, D. P. (1986). Using humor to help children with pain. Children's Health Care, 14, 187-188.

The Holy Bible (New International Version). (1984). Grand Rapids: Zondervan.

Trice, A. D., & Price-Greathouse, J. (1986). Joking under the drill: A validity study of the Coping Humor Scale. Journal of Social Behavior and Personality, 1, 265-266.

White, R. W. (1985). Strategies of adaptation: An attempt at systematic description. In A. Monat & R. S. Lazarus (Eds.), Stress and coping: An anthology (2nd. ed., pp. 121-143). New York: Columbia University Press.

White, S., & Camarena, P. (1989). Laughter as a stress reducer in small groups. International Journal of Humor, 2, 73-79.

White, S., Winzelberg, A., & Schultz, B. (1988). Laughter as a stress reducer. Unpublished manuscript, University of California, Santa Barbara, Student Health Service.